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EDITORIAL.

Food Crops on Estates.

His Excellency the High Commissioner in a recent speech appealed to estate managers to assist in the defence of Malaya by interplanting their new or replanted areas with foodstuffs. His Excellency also made it known that the Federated Malay States Government was prepared to extend the system of rebate of rent to any estate land set aside for cultivation as allotments by the labour force.

The successful development of allotment gardens was referred to in the November 1938 number of this Journal; in the present issue we are more concerned with His Excellency's further recommendation to estate owners that they should consider the possibility of developing the food resources of Malaya by the cultivation of food crops on new and replanted areas of rubber.

On another page we publish an article by Mr. W. N. C. Belgrave on the cultivation of food crops on estates, which provides brief cultural notes on such crops as are considered suitable for this type of cultivation.

A leaflet, in English and Tamil, describing suitable crops for allotments may be obtained free of charge from the Department of Agriculture, and also, from the same source, the issue of this Journal referred to above at a cost of 50 cents, post free.

Derris Manurial Experiments.

Consequent upon the development of derris as a secondary crop of importance the economics of manuring become an important consideration. Manurial experiments have been conducted by the Department of Agriculture during recent years and an account of earlier investigations has appeared in this Journal.

As a result of those investigations two species, *D. malaccensis* var. *sarawakensis* and *D. elliptica*, Sarawak creeping, were considered to be the most promising, judged by yield of root and their economic possibilities. The first species, supplying a high ether extract, was particularly suitable for the United Kingdom market, and the second species, *D. elliptica*, Sarawak creeping, with a high rotenone content, was suited to the United States market, which regards rotenone as the primary constituent.

In the present number of this Journal appears the account of manurial trials with the above two species of derris, and the results of this further investigation are both interesting and important.

The experiment with both species consisted of three manurial treatments and a control. Briefly, the results were that *D. malaccensis* var. *sarawakensis* responded markedly to the application of manures in contrast to a poor yield on the control plots. On the other hand, manurial treatments were without significant effect in the case of *D. elliptica*, Sarawak creeping, but the control plots, *i.e.* no manurial treatments, yielded practically double the quantity of root obtained from the first species with the most satisfactory manurial treatment.

Viewed, therefore, purely from the aspect of yield of root in relation to the necessity for manurial treatment, *D. elliptica*, Sarawak creeping, is very obviously the more satisfactory species to plant. There has been, moreover, a recent change in the requirements of the United Kingdom derris market; British insecticide manufacturers now regard rotenone content as of more importance than previously.

It would appear, therefore, that *D. elliptica*, Sarawak creeping, is a suitable species to plant, meeting, as it does, the requirements of both British and American manufacturers with regard to rotenone content, in addition to providing a high yield of root.

Original Articles.

THE CULTIVATION OF FOOD CROPS ON ESTATES

BY

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In the course of a speech on Defence made in the Federal Council on the 18th May His Excellency the High Commissioner said:

> " The Government of the Federation is prepared to extend further the system of rebate of rent on any estate land suitable for the purpose which estate owners may wish to set aside as allotments for the cultivation of foodstuffs by their labourers. Enquiries should be addressed to the British Residents. Suitable foodstuffs would be groundnuts, cassava, sweet potatoes, maize, bananas and vegetables of all sorts, especially onions, but the selection would be left to the individual. I have also asked estate owners to consider whether they can plant foodstuffs as a cover crop on the areas now being opened up for new planting or for the replanting of rubber. If they cannot do it themselves, they might be able to let out the work to a contractor. I have also asked the Malayan Governments to make as easy as possible the alienation of land for the growing of vegetables."

An article describing certain successful allotment gardens was published in the *Malayan Agricultural Journal* for November, 1938. This publication may be obtained on application to the Department of Agriculture, price 50 cents post free. A leaflet in English and Tamil describing suitable crops for allotments may also be obtained from the same source, free of charge.

It is hoped that the following notes may be of service to those in charge of rubber estates who contemplate planting of foodstuffs on new or replanted areas.

The dominant factor in relation to the growth of dry land food crops in Malaya is the comparative poverty of our soils. On virgin soil one good crop should be obtained and a second medium crop is often possible, but thereafter yields decline rapidly unless heavy manuring with animal manure or compost be undertaken. Large quantities of animal manure are unobtainable on all but a few estates; compost can be made from slashings of natural growth or cover but transport is likely to be expensive. The aim of estates should be to plant relatively small areas sufficient for their own population, so that fresh land may be available in a second or subsequent season.

Steep slopes are unsuited to food cultivation. Undulating land can be used when terraced; even then great care must be taken to avoid soil erosion. Cover crop, if already established, should be left at the edge of the terrace in order to prevent loss of surface soil; if not established, cover should be planted in this position.

On flat land drainage is essential. On peaty areas care must be taken to adjust the height of the water table to prevent the crop suffering from lack of moisture during the dry season.

Effect of Food Crops on Rubber.

Authorities of the Rubber Research Institute of Malaya are of opinion that so far as the trees are concerned "Food crops could probably be cultivated for the first two years after planting without affecting the trees directly. It is suggested that after two years, cultivation of food crops, particularly root crops would be harmful, the longer the period after planting the greater the ill effects." On theoretical grounds, however, the same authorities fear that cultivation (necessarily deep for root crops) may destroy the natural structure of the soil thus ultimately reducing its capacity to absorb water. The obvious danger from erosion is also stressed. Those responsible for rubber estates must of course exercise their own judgment but the writer of these notes is definitely of the opinion that the cultivation necessary to grow one crop, even if a root crop, will not seriously, if at all, impair soil structure. The importance to Malaya of food production will doubtless be given due consideration.

New Plantings.

Possible crops for virgin soil, in order of duration, are ragi, groundnuts and maize, sweet potatoes, yams, bananas and tapioca. Short notes on these follow and further information may be obtained from State Agricultural Officers. Combining the figures for yields given in the notes with the known energy producing value of the various foods, it appears that to replace the normal rice ration of one person for one year would require the produce from 1/10th to 1/7th of an acre of root crops; thus an area of 20 to 30 acres of such crops should produce enough food for a population of 200 for one year.* In point of fact it is unlikely that these foodstuffs would be required completely to replace rice, their use would be rather to supplement a reduced rice ration. Such small areas should be within the means of nearly all estates undertaking new planting. Groundnuts have a higher food value but a lower yield than root crops and the equivalent of a year's ration of rice should be secured from one-quarter of an acre.

Estates would be well advised to plant a mixture of crops in order to take advantage of their differing maturation periods and also to guard against the failure of one or more of them from unsuitable soil conditions or pest attack.

Replanting.

Cropping on replanted areas is a more difficult matter. Practically all such areas suffered severely from exposure in early years and on them tapioca alone may be expected to give even moderate yields. Where compost can conveniently

* These figures are based on the assumption that quantities of foodstuffs supplying similar amounts of energy (expressed in calories) are of equal food value. This is believed to be reasonably correct over a relatively short emergency period but it should be realized that no claim is made that this basis of calculation is valid from the point of view of maintenance of optimum health over lengthy periods.

be applied, a dressing of 10 tons to the acre is recommended, or failing this, the turning in of a cover crop. It is of little use to plant even tapioca on poor, washed, baked soil without preliminary treatment.

Planting Material.

A certain amount of fresh ragi seed is obtainable from the Central Experiment Station, Serdang. Local supplies of planting material of the other crops should suffice for a moderate amount of planting, but any sudden increase of demand which would arise in the event of an emergency might exhaust local supplies. Estate managers who do not see their way immediately to respond to His Excellency's appeal would, therefore, be well advised to lay down areas of one or two acres of nursery to provide their own planting material should this be required later.

Root crops, if near the jungle, may suffer from the depredations of wild pig and it may be necessary to guard such areas or to set poison baits.

Crops.

The food crops which are recommended for planting are detailed below. Brief cultural notes are offered on each crop.

(a) RAGI.

This crop provides one of the most important foods of the Telegu community. Tamils also grow it in their own gardens to a limited extent but showed themselves reluctant to eat it in quantity during the last rice shortage. It is, however, a valuable crop for estates employing Telegu labour, more especially as it will thrive on land of only moderate fertility. The seed rate is 5 lbs. per acre. Yields varying from 500 to 1,000 lbs. per acre may be expected. Owing to the depredations by birds at the time of harvest children should be employed to scare birds.

(b) GROUNDNUTS.

Groundnuts require a light, friable, well-drained soil; heavy compost soils are unsuited to them. A dressing of lime at the rate of 1 ton per acre is recommended. The soil is worked to a depth of about 5 ins. and seed is planted on ridges of 18 ins. apart; seed should be dibbled in on the ridges at 12 ins. intervals, using two or three seeds at each point. Planting towards the end of the wet season is recommended. The nuts are ready to harvest about 100 days after sowing. Yields of about 1,000 lbs. of clean nuts per acre should be secured under favourable conditions. The pods are particularly liable to depredation of rats while the plant is still growing and poison baits would doubtless be advantageous.

(c) MAIZE.

The best soils for maize are rich, light sandy loams along the banks of rivers or streams, more especially where intermittent flooding occurs. Peaty soils are to be avoided and heavy clays are unsuitable; poor soils are useless. The land should be dug over and seed dibbled into holes 2 to 3 ins. deep, spaced 9 to 12 ins. apart

in rows 3 ft. apart. Generally three seeds are placed in each hole and lightly covered with soil which is compressed by the foot of the sower. Planting is best done in March, April or November. Surface weeding is undertaken; later the weaker plants are removed to leave one at each point and as the crop increases in height the soil is mounded around the base of the plants. The crop matures in 3 to 6 months according to variety. Yields of grain of 1,800 to 2,000 lbs. per acre may be expected under favourable conditions.

(d) Sweet Potatoes.

This crop thrives best in a light sandy loam which has been deeply cultivated. Propagation is by cuttings of semi-matured portion of the stem, about 9 ins. long; two nodes are placed underground and one is uncovered, the cuttings are planted about 30 degrees from the horizontal and the soil is compacted around the cuttings. They are planted about 18 ins. apart on ridges which are spaced from 2 to 3 ft. from centre to centre. The trailing stems are periodically turned back on the ridges to prevent them rooting in the soil and causing consequent decrease in the size of the main root tubers. The crop may be harvested from 3 to 6 months after planting depending on variety, and the yield of tubers varies from 3 to 6 tons per acre depending on the level of the fertility of the land and on the variety used. To ascertain whether the crop is ready for lifting a few tubers may be examined. If they be cut through and the sap dries rapidly forming a white crust they are matured. Another indication of maturity is when the leaves begin to turn yellow.

(e) Yams.

Yams are propagated from tubers, which are usually permitted to sprout and afterwards cut into "sets," each of which should include two young shoots. Deep cultivation and thorough drainage is required. A loose type of soil is the most suitable. Sets are planted at 2 ft. intervals in ridges 4 ft. apart. The crop takes about 10 months to mature and maturity is indicated by cessation of growth and drying of the leaves. The tubers are lifted as required as they do not keep long after harvest. On the other hand if left too long in the ground they become woody and start to sprout. Yields of 7 to 10 tons per acre may be expected, and on soils of high fertility these yields may be doubled.

There are two types of yams, the greater yam which is a coarse tuber and the lesser yam which is of a finer type, and is in general preferred. Some of the lesser yams are thorny climbers; tubers are smaller than those of the greater yam, but are produced in greater quantity, but the yield per acre is not necessarily greater.

Both yams have been found to give higher yields if the plants are allowed to climb strong poles about 10 ft. high.

(f) Bananas.

The banana flourishes best on heavy soils fairly rich in organic matter and also in moist situations provided the soil is well drained. Propagation is effected by small suckers which are planted at distances of 10 to 15 ins. apart. Large holes are

opened and partly filled with good surface soil. The first bunch of fruits is usually produced at about 1 year from planting. Too many suckers should not be allowed to grow from one parent plant. The variety *Pisang Embun* is probably the heaviest yielder and, therefore, the most desirable for the purpose in view.

Bananas in Malaya are subject to attack of Panama disease, but provided that suckers are obtained from areas where the disease is non-existent there should be a good chance of obtaining at least one harvest.

(g) Tapioca.

Tapioca will grow on almost any well-drained soil. It has for long borne the reputation of being an extremely exhausting crop, but this bad reputation is not due to the crop itself but to the methods of cultivation formerly employed. Many crops of tapioca were taken off the land without manuring or adequate measures for the prevention of soil erosion, and the land was then allowed to revert to natural conditions.

Tapioca is best planted on ridges at 3 ft. intervals and 3 ft. distance, but may also be planted on the flat. It is propagated by cuttings taken from mature part of the stem. Cuttings 5 to 6 ins. long are planted at an angle of about 30 degrees from the horizontal, with three-quarters of the cutting below the surface of the soil, which is consolidated by treading. The planting distance recommended is closer than that usually employed by Chinese but has the advantage that the necessity for weeding is greatly reduced.

The crop takes from 12 to 14 months fully to mature but current requirements may be lifted 7 or 8 months after planting. Yields of about 7 tons per acre should be obtained under favourable conditions.

Pigs.

The rearing of pigs, more especially where a nucleus already exists, is worthy of serious consideration. The number of pigs in Malaya has been rising steadily during the past few years and breeding animals should be easy to procure.

Sweet potato foliage provides an excellent basis for pig food. Cropping of the vines is done at intervals of 1 month to 6 weeks and liberal application of liquid (pig) manure is made after each cutting to induce fresh growth. Tuber production is not aimed at.

Another good food is colocasia (*ubi keladi*) which grows luxuriantly on the coastal flats. Both leaves and stem are employed, after cooking, for pigs, and the tubers are fit for human consumption.

Experiments conducted at Serdang have shown that pigs fed on a ration containing copra made normal live weight increases and suffered no ill effects from the excess of oil ingested.

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THE MALAYAN RUBBER PLANTING INDUSTRY IN 1938.

Compiled from official and other records by the Economics Branch of the Department of Agriculture, S.S. and F.M.S.

Prices.

The Singapore spot price for No. 1 X. Ribbed Smoked Sheet at the beginning of the year was 22¾ cents per lb. The price improved during January and February to 24⅜ cents but fell heavily in March to 16⅜ cents and to 16 cents at the beginning of April. The same month, however, saw a recovery to 21⅜ cents, and, after a slight fall in May, a further steady improvement to 29¼ cents in October, the year closing at 28¼ cents.

The average prices per lb. for the year in the principal markets are shown in Table I, together with corresponding figures for 1937.

Table I

Prices of Rubber per lb.

Market	1937	1938
Singapore (cents, Straits) ...	32.09	24.39
London (pence, sterling) ...	9.42	7.29
New York (cents, gold) ...	16.30	14.56

Areas.

The total area under rubber in Malaya at the end of 1938 was estimated to be 3,296,647 acres, as shown in Table II.

The total area of reserve land on estates* in Malaya at the end of 1938 was 631,286 acres; of this total 21,807 acres were building sites, and 76,783 acres planted with other crops. The total mature area, *i.e.* planted during the season 1930-31 or earlier, was 1,891,878 acres, and the tappable area, as declared by estates, was 1,895,795 acres.

Ownership and Constitution of Estates.

Of the total area of rubber on estates, 2,031,969 acres, 75.3 per cent. is European owned, 15.9 per cent. is owned by Chinese, 4.3 per cent. by Indians, and 4.5 per cent. by other nationalities.

* Estates = estates of 100 acres and over.
Small holdings = estates of under 100 acres.

Table II.

Area Under Rubber in Malaya as at end of 1938.

(in acres)

Territory.	Estates*			Small Holdings†	Total Planted Area
	Mature Area	Immature Area	Total Planted Area	Total Planted Area	
Perak ...	284,285	22,597	306,882	256,264	563,146
Selangor ...	321,221	30,685	351,906	144,577	496,483
Negri Sembilan ...	266,574	16,760	283,334	97,960	381,294
Pahang ...	84,569	5,735	90,304	82,382	172,686
Total F.M.S. ...	956,649	75,777	1,032,426	581,183	1,613,609
Malacca ...	121,437	4,950	126,387	67,983	194,370
Province Wellesley ...	43,326	1,724	45,050	23,160	68,210
Penang Island ...	2,476	402	2,878	14,913	17,791
Singapore Island ...	32,298	245	32,543	20,376	52,919
Labuan ...	—	—	—	1,834	1,834
Total S.S. ...	199,537	7,321	206,858	128,266	335,124
Johore ...	479,541	45,614	525,155	365,996	891,151
Kedah ...	201,928	9,084	211,012	90,752	301,764
Perlis ...	1,450	224	1,674	3,605	5,279
Kelantan ...	31,285	1,268	32,553	59,420	91,973
Trengganu ...	15,361	512	15,873	27,127	43,000
Brunei ...	6,127	291	6,418	8,329	14,747
Total U.M.S. ...	735,692	56,993	792,685	555,229	1,347,914
Total Malaya ...	1,891,878	140,091	2,031,969	1,264,678	3,296,647

* Estates = 100 acres and over.

† Small Holdings = under 100 acres.

Acreage of mature rubber represents acreage planted in season 1930—1931 or earlier.

There were 2,509 rubber estates recorded in Malaya at the end of 1938, of which 856 (1,502,128 acres) were owned by public limited liability companies; the remainder, 1,653 (529,841 acres), were the property of private limited liability companies or privately owned.

There were 1,562 estates (317,889 acres) between 100 and 500 acres planted area, 362 estates (262,874 acres) between 500 and 1,000 acres, 532 estates (1,055,083 acres) between 1,000 and 5,000 acres, and 53 estates (396,123 acres) over 5,000 acres.

Areas Out of Tapping.

The area out of tapping on estates at the end of the year was 531,512 acres, or 28.5 per cent. of the estimated acreage of tappable rubber. In addition, 329,501 acres (17.6 per cent.) were being rested under rotational tapping systems. At the end of January 1938, 10.1 per cent. of tappable rubber was out of tapping, (excluding rotational system resting), but this percentage increased through the year with the decrease in the quota release.

On small holdings it was estimated that 458,900 acres, or 36.4 per cent. of the total area of small holdings, were out of tapping at the end of the year. The area of small holdings out of tapping varies considerably, and fuller reference is made to this subject on a later page.

Budgrafted Areas.

Table III shows the area budgrafted on estates at the end of 1938, together with corresponding figures for 1936 and 1937. Statistics are not available as to budgrafted areas on small holdings, but the total area in 1938 was negligible.

In the following table only the proportion of budgrafts in areas of mixed budgrafts and seedlings is taken into account. The area of budgrafts only (approved clones) was 203,040 acres. The total area of mixed budgrafts and seedlings was 78,806 acres, and there were 19,435 acres planted with clonal seed.

At the end of 1938, of the total area of budded rubber (248,591 acres), 164,466 acres had reached the tappable stage, and 101,410 acres were being tapped.

Table III.

Areas of Budgrafted Rubber in Malaya.

	1936		1937		1938	
	No. of areas	Total acreage	No. of areas	Total acreage	No. of areas	Total acreage
Federated Malay States ...	402	111,369	445	120,927	479	138,140
Straits Settlements ...	51	3,833	54	4,634	57	6,681
Unfederated Malay States ...	175	93,734	178	94,364	197	103,770
Total ...	628	208,936	677	219,925	733	248,591

The Rubber Regulation Scheme.

The International Agreement 1934-38 for the regulation of rubber production continued in operation during the year. Malaya's basic quota was 602,000 tons, out of a world quota of 1,335,250 tons, and the releases were: for the 1st quarter 70 per cent.; 2nd quarter 60 per cent.; 3rd quarter 45 per cent.; 4th quarter 45 per cent., averaging 55 per cent. over the whole year.

The International Agreement, which was due to terminate on 31st December 1938, was renewed for a further period of five years from 1st January 1939. The terms of the Agreement have been revised and new planting will be permitted from 1st January 1939 to 31st December 1940 up to 5 per cent. of the total planted area, and after 31st December 1940 up to percentages to be fixed by the International Regulation Committee. Unconditional replanting is also permitted, but the Committee has the power to review the position and limit replanting after the 31st December 1940. Applications for replanting have, however, to be approved by the Controller of Rubber.

Production, Exports and Stocks.

The production of rubber in Malaya during 1938 totalled 360,898 tons, as compared with 503,127 tons in 1937. Table IV shows the distribution of production.

Table IV.*

Malayan Production of Rubber in 1938.

Area	Production by estates of 100 acres and over	Production by estates of less than 100 acres	Total Production
	Tons	Tons	Tons
Federated Malay States ...	129,728	54,330	184,058
Straits Settlements ...	19,193	9,906	29,099
Unfederated Malay States ...	97,299	50,442	147,741
TOTAL 1938 ...	246,220	114,678	360,898
TOTAL 1937 ...	314,658	188,469	503,127

The exports of rubber in concentrated forms of latex were 4,477 tons less than in 1937, and are shown in Table V. The quantity of rubber estimated to be contained in this exported latex is included in the figures of production given above, and also in the figures of total exports given in Table VII.

* Abstracted from the December statement of acreage, stocks, production, imports and exports of rubber, etc., published by the Registrar-General of Statistics, Straits Settlements and Federated Malay States.

Table V.

Exports of Rubber in Concentrated Forms of Latex.

Year	Dry rubber content of latex in lbs. per gallon			Total	Value
	Under 4.8 lbs.	4.8 to 5.7 lbs.	Over 5.7 lbs.		
	Tons	Tons	Tons	Tons	$
1931 ...	—	—	—	1,925	472,123
1932 ...	—	—	—	5,192	1,110,103
1933 ...	—	—	—	10,470	2,871,407
1934 ...	—	—	—	14,172	7,119,548
1935 ...	5,286	5,490	2,374	13,150	6,585,369
1936 ...	6,778	7,073	3,086	16,937	10,673,229
1937 ...	7,122	7,512	4,774	19,408	15,429,910
1938 ...	3,630	4,554	6,747	14,931	8,686,793

Local consumption of rubber by manufacturers of rubber goods, tyres, tubes, belting, shoes, etc., amounted to 512 tons, as compared with 576 tons in 1937, 435 tons in 1936 and 593 tons in 1935.

Table VII summarizes shipments of crude rubber from producing countries since 1931. This table is compiled from the Statistical Bulletin of the International Rubber Regulation Committee.

Conditions on Estates.

Estates generally have been maintained in good condition. Manuring has continued to increase in popularity and is developing into a standard practice on many estates.

The scheme for experimental planting of new land was completed in 1938. Experiments are carried out under the control of the Rubber Research Institute of Malaya, with whom and the Controller of Rubber, the estates concerned enter into an agreement as regards maintenance and continuity. The experiments are designed to investigate all important aspects of rubber planting.

Under Rubber Regulation replanting was permitted to the extent of 10 per cent. of each owner's holding in any one year, and to a total of 20 per cent. of the holding during the period 1st June, 1934 to 31st December, 1938. The area replanted during 1938 was 24,350 acres, and the total area replanted since 1st June 1934 (the commencement of Rubber Regulation) amounted to 81,488 acres.

Table VI.

Rubber Stocks in Malaya at end of 1938.

Stocks	Tons
At ports	6,152
In hands of dealers	31,077
On estates of over 100 acres	47,670
Total ...	84,899

Stocks held by small-holders are considered to be negligible.

Table VII.

Shipments of Crude Rubber from Producing Countries.*

(tons)

Year	Malaya includ: Brunei & Labuan	Nether-lands Indies	Ceylon	Sarawak	Siam	French Indo-China	All other Sources	Total
1931	423,000	257,000	62,300	10,400	3,600	11,000	32,400	799,700
1932	406,000	211,000	49,300	7,100	3,000	13,500	18,800	708,700
1933	445,800	282,300	63,800	11,100	7,000	17,300	26,200	853,500
1934	467,400	379,400	79,100	17,600	17,700	19,600	38,300	1,019,100
1935	417,000	282,900	54,300	19,300	28,300	28,700	42,100	872,600
1936	353,700	309,600	49,700	21,000	34,600	40,800	46,300	855,700
1937	469,900	431,700	70,400	25,900	35,600	43,400	59,200	1,136,100
1938	372,046	298,112	49,528	17,792	41,618	58,518	53,109	890,723

* Abstracted from the Statistical Bulletin of the International Rubber Regulation Committee, Vol. 5, No. 3, March, 1939.

Conditions on Small-Holdings.

Quarterly surveys of small holdings out of tapping were made during the year and the results of such surveys are summarized in Table VIII, which also includes December 1937 figures for the purpose of comparison.

Table VIII.

Percentages of Areas of Small Holdings Out of Tapping during the year 1938.

Territory	December 1937	March 1938	June 1938	September 1938	December 1938
	per cent.	per cent.	per cent.	per cent.	per cent.
Federated Malay States ...	19.1	31.5	39.9	45.9	44.2
Straits Settlements ...	10.1	23.1	25.3	33.0	35.6
Unfederated Malay States ...	13.9	21.8	27.6	25.7	27.7
MALAYA ...	16.0	26.9	33.2	36.0	36.4

It will be seen that the number of small holdings out of tapping increased considerably, and this increase was due primarily to the reduced quota operative during the year with the corresponding reduced coupon allowance to small-holders. Another factor was the low price ruling for uncouponed rubber which ranged from $5 to $6 per picul, as it is generally considered uneconomic to tap if the price falls below $6 per picul.

Coupons were again treated as a separate commodity and sold as such, and prices varied considerably, ranging from $20 to $30 per picul equivalent.

An additional trade developed in connexion with the new planting allowed under the International Rubber Regulation Scheme. Small-holders received their rights for new planting in the form of share certificates, each share giving the right to plant 1/20th acre of rubber trees. Many small-holders disposed of their certificates to rubber dealers at prices ranging from 60 cents to $1.30 per share. Despite, however, the widespread disposal of share certificates, small-holders in many districts are using their shares to increase their area under rubber, and in the last quarter of the year share certificates had increased in value to $1.50.

In order to meet any demand which there may be from small-holders for high-quality planting material for new planting, nurseries have been laid down at a number of Agricultural Stations for multiplying suitable clones of budwood for sale at cost price.

Attention was directed throughout the year to improvement in the quality of small-holding rubber, and considerable help and encouragement were given by the Asiatic Rubber Instructors to small-holders.

An obvious essential to any sustained improvement in the quality of the rubber made by small-holders is that they should be able to obtain a premium for the better product sufficiently large to make it economically worthwhile for them to expend

the extra labour and time involved in making the better product. In localities where this essential has obtained smoke cabinets have proved very satisfactory and well adapted to the small-holder's needs.

Unfortunately in most parts of the country there has been a tendency during the year for the margin of price between smoked and unsmoked sheet to narrow considerably and, at the end of the year, in most rural areas this margin has been much too small for it to pay the small-holder to produce smoked sheet, and smoke cabinets, erected under more favourable conditions in this respect, have, for the most part, remained idle.

The general condition of small holdings is satisfactory, and here again valuable help has been given by the Asiatic Rubber Instructors. From most States reports are received of terracing, silt-pitting, general clearing up, or slashing of undergrowth, but there is no indication of sustained improvements and amelioration of conditions.

Propaganda on the improvement of tapping was continued by the Asiatic Rubber Instructors but improvement in this direction is slow.

Pests and Diseases.

Rats have become a serious pest in many replanted areas and in some new planted areas, and special measures have been developed to combat them.

The cockchafer pest has continued to spread in certain areas situated in the vicinity of jungle although it is not yet a very serious problem. The position is being carefully watched and experiments in preventive measures are being undertaken.

Thrips and mites continued to give a certain amount of trouble in young rubber areas; control was maintained by sulphur dusting.

Giant snails also continued to be a pest in young areas. "Meta" fuel poison baits are now an established method for the immediate control of this pest, followed by the use of calcium arsenate bricks to maintain control.

The control of "white ants" is now receiving more attention on small holdings than was formerly the case. Chemicals for this purpose have been supplied in some districts at cost price through the Department.

Mouldy rot is still the most serious disease affecting rubber small holdings. The Department has continued to sell approved fungicides at cost price to small-holders, and Asiatic Rubber Instructors have helped in their distribution.

Labour.

The total labour force employed on estates at the end of 1938 was 296,307, composed of 196,312 men, 79,947 women, and 20,048 children, or 14.6 labourers employed per 100 planted acres of rubber. At the end of 1937 the total estate labour force was 351,404 persons, or 17.3 per 100 acres.

Acknowledgment.

Acknowledgment is made to the Rubber Research Institute of Malaya for information supplied relating to conditions on estates and to pests and diseases.

MANURIAL TRIALS WITH DERRIS

BY
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Introductory.

An account was given in a previous number of this Journal(1) of an exploratory manurial experiment carried out with various species of Derris at the Central Experiment Station, Serdang.

The results showed that the application of artificial manures with and without the addition of lime caused significant increases in yield of root.

Of the various species of Derris included in that experiment, *D. malaccensis* var. *sarawakensis* and *D. elliptica,* Sarawak creeping, were the two most promising judged by yield of root and economic possibilities. Roots from plants of the first named species, which are characterized by a high ether extract combined with low rotenone content, were then favoured by British insecticide manufacturers. Roots of *D. elliptica,* Sarawak creeping, with their higher rotenone content, even though this is associated with a moderate ether extract, were more likely to find a market in the United States of America, where root is judged primarily on its rotenone content.

The present paper describes further manurial trials carried out with these two species at Serdang.

Lay-Out of Experiment.

The site chosen was in Field 14. The soil is rather heavy; it may be described as a greyish yellow loam containing from 40 to 50 per cent. fine fractions.

The lay-out in both cases was a 4 x 4 Latin square. Each plot measured 35 ft. x 39 ft., equivalent approximately to 1/32nd acre. An unplanted discard area, 6 ft. wide, surrounded each plot.

A plan of the lay-out of one set of plots is shown in Diagram I.

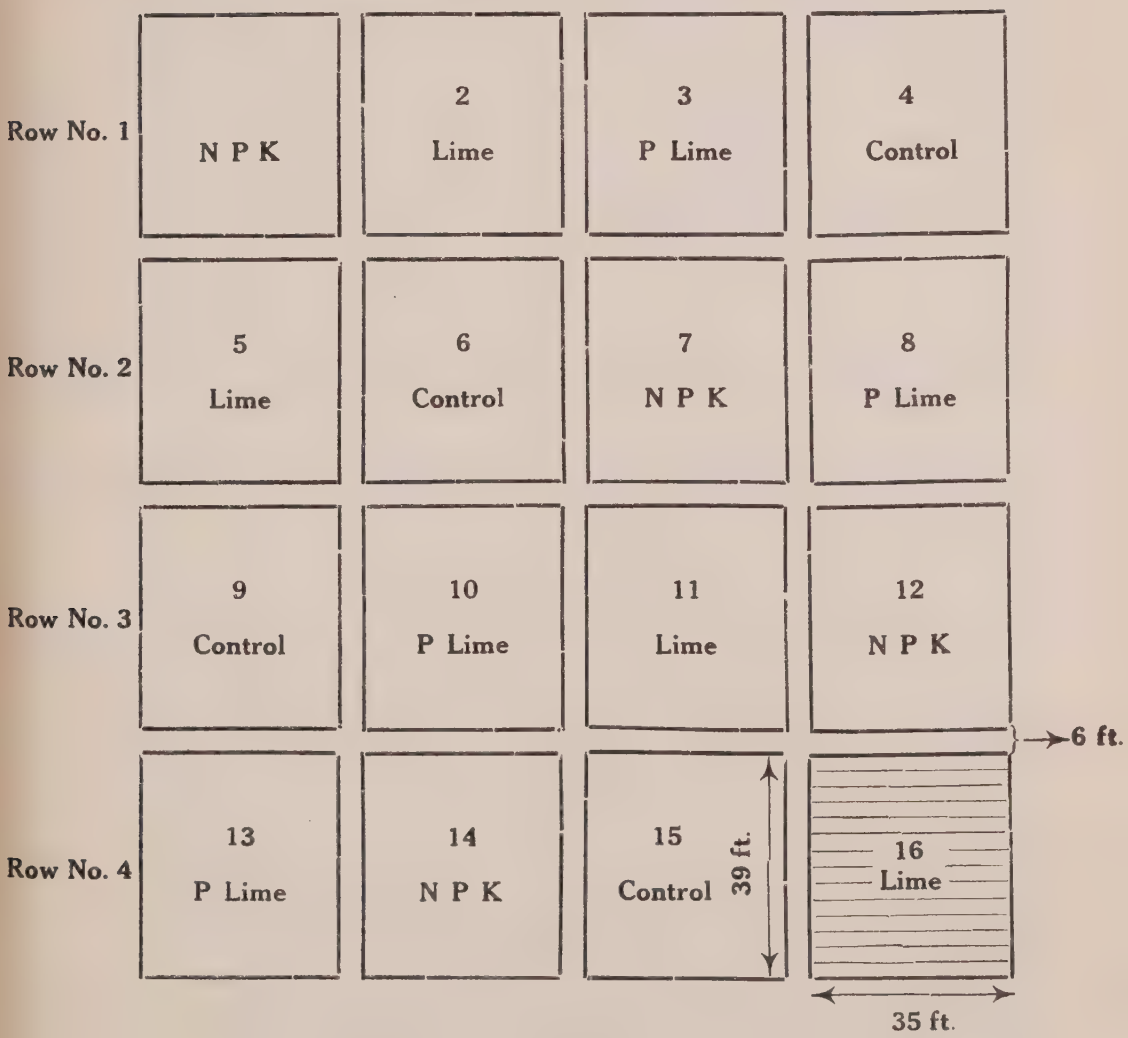
Planting and Manurial Treatments.

The land had been under cover crops for three years before the experiment. Deep cultivation was given before planting the rooted cuttings. In both cases the cuttings were taken from a mixed population and randomized before striking.

The cuttings were set in rows 3 ft. apart with the same distance between the plants in each row. There were 13 rows with 12 plants in each row.

Diagram I.

Arrangement of Plots in Manurial Trials.



Note.—The numbers refer to the individual plots, the respective manurial treatment being shown below in each case.

The plots of *D. malaccensis* var. *sarawakensis* were planted in November, 1935, those of *D. elliptica*, Sarawak creeping, a month later.

The experiment comprised three manurial treatments and a control as shown below:—

Treatment No.	Details of Manure		Rate of Application lbs. per acre.
1	Calcium cyanamide	—	280 (53 lbs. N)
	Basic slag	—	336 (54 lbs. P_2O_5)
	Sulphate of potash	—	56 (30 lbs. K_2O)
2	Rock phosphate	—	336 (101 lbs. P_2O_5)
	Slaked lime	—	533
3	Slaked lime	—	1,066
4	Control (no treatment)		

The manurial dressings were applied in January 1936, that is two months after planting in the case of *D. malaccensis* var. *sarawakensis* and one month for *D. elliptica*, Sarawak creeping.

During June, 1936, seed of *Crotalaria usaramoensis* was sown between the rows of plants with the object of suppressing the growth of weeds. The cover plants were cut back some five months later.

Harvesting and Analysis of Roots.

Harvesting was carried out during January, February and March 1938. The plots of *D. malaccensis* var. *sarawakensis* were cleared first. In both cases the plants were between 25 and 26 months old when harvested.

The development of the plants of *D. malaccensis* var. *sarawakensis* contrasted somewhat unfavourably with those of *D. elliptica*, Sarawak creeping. Whereas the latter had formed a dense cover successfully suppressing weed growth, the *D. malaccensis* var. *sarawakensis* plants were rather thin and straggly. The erect nature of this species necessitates frequent cultivation if the plants are not to suffer as a result of competition from weeds.

The following procedure was adopted. The stems of the individual plants in each plot were cut down to ground level, after which the roots were lifted. The roots were cleaned from adhering soil and separated from the stems, which were discarded.

The roots were sun-dried until individual pieces snapped when bent. The roots were then weighed, all pieces having a diameter greater than half an inch being excluded. The material was sampled by quartering until about 2 lbs. remained. This quantity was chopped finely and a moisture determination of the material carried out immediately. The weight of root for each plot was then calculated on a standard moisture content of 8 per cent. Root of this moisture content is termed "air-dry."

Another portion of the finely chopped material was ground for analysis. Both rotenone and ether extract determinations were made.

In the case of plants of *D. elliptica,* Sarawak creeping, a varying proportion of fine stem roots is found. The removal of these roots is a tedious operation and might not be practicable in the cultivation of the crop on a large scale.

In the case of two plots for each manurial treatment these stem roots were collected for the purpose of obtaining information regarding the proportion which they bear to the root as harvested ordinarily, and also of determining their toxic content.

No account has been taken of these stem roots in calculating the figures for yields in connexion with the manurial treatments.

The details for yield of root and toxic content for each species are given separately.

(A) *Derris malaccensis* var. *sarawakensis.*

Table I shows the yields of air-dry marketable root from individual plots arranged according to rows and manurial treatments.

Table I.

Yields of Air-dry Marketable Root of *Derris malaccensis* var. *sarawakensis* per Plot.

Row No.	Manurial Treatment				Row Total
	N P K	P Lime	Lime	Control	
	lbs.	lbs.	lbs.	lbs.	lbs.
1 ...	28.7	24.1	16.1	10.8	79.7
2 ...	33.0	27.0	32.1	15.3	107.4
3 ...	32.5	37.2	36.9	20.7	127.3
4 ...	37.4	37.5	39.8	27.9	142.6
Manurial Treatment Totals ...	131 6	125.8	124.9	74.7	457.0
Manurial Treatment Means ...	32.9	31.4	31.2	18.7	General Mean 28.6

Table II shows the calculated yields of root per acre for the various manurial treatments, the yields expressed as percentages of the control, and the costs of the manures based on prices prevailing in January, 1936.

Table II.

Calculated Yields of Root of *Derris malaccensis* var. *sarawakensis* per Acre, Yields of Root expressed as Percentages of Control, and Comparative Costs of Manures.

Manurial Treatment	Mean Yield of Root per Plot	Calculated Yield of Root per acre	Yield of Root calculated as Percentage of Control	Cost of Manures per acre (January 1936)
	lbs.	lbs.	per cent.	$
N P K ...	32.9	1050	175.9	20.00
P Lime ...	31.4	1002	167.9	10.50
Lime ...	31.2	996	166.8	9.00
Control ...	18.7	597	100.0	—

The results may be summarized as follows:—

(*a*) A substantial increase in yield for each of the three manurial treatments.

(*b*) A statistical analysis of the figures shows that these increases are due to the manurial dressings. (Treatments significant at 100 to 1 chance).

(*c*) The mean increase in yield due to manurial treatments is 70.2 per cent. The small variations from the mean for the different treatments are not statistically significant.

(*d*) The application of slaked lime at the rate of approximately half a ton per acre is the most economical treatment under the conditions of the experiment.

(*e*) The low figures for yields on the unmanured plots confirm those obtained in a previous experiment carried out in the same field with this species in which yield of root and toxic content were correlated with age of plants(2). In that experiment the calculated yield of air-dry marketable root per acre from plants of approximately the same age was 664 lbs. compared with 597 lbs. in the present experiment.

Table III shows the figures for rotenone and ether extract for average samples of root from the individual plots together with the true averages for the different manurial treatments and control.

The figures indicate that the lowest rotenone and ether extract are associated with the complete manurial treatment. Statistical analysis shows, however, that the differences in toxic content, both for rotenone and ether extract, between treatments are not significant.

Table III.

Rotenone and Ether Extract of Marketable Root of *Derris malaccensis* var. *sarawakensis* from Individual Plots.

(Moisture-free basis)

Manurial Treatment	Serial No. of Plot	Rotenone	Average Rotenone*	Ether Extract	Average Ether Extract*	Proportion of Rotenone to Ether Extract	Average Proportion of Rotenone to Ether Extract*
		per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
N P K	1	2.84		19.57		14.5	
	7	2.64	3.29	18.99	21.05	13.9	15.6
	12	3.84		22.38		16.3	
	14	3.73		22.85		17.1	
P Lime	3	3.32		20.32		16.3	
	8	4.13	3.80	24.74	23.44	16.7	16.2
	10	3.72		23.32		16.0	
	13	3.96		24.62		16.1	
Lime	2	3.69		20.61		17.9	
	5	2.90	3.67	21.03	23.98	13.8	15.3
	11	3.91		26.42		14.8	
	16	4.07		25.47		16.0	
Control	4	3.39		23.72		14.3	
	6	4.34	3.82	26.38	24.29	16.4	15.7
	9	3.55		23.08		15.4	
	15	3.91		24.26		16.1	

* The average figures are the true averages calculated from the corresponding yields of root on each plot.

The average ether extract, calculated on a moisture-free basis, is 23.19 per cent. This is nearly 2 per cent. higher than that found in the previous experiment carried out with this species and to which reference has already been made (2). In that experiment the average figure for roots from plants aged 24 months was 21.23 per cent. on a similar basis.

The narrow range of variation in the figures for the proportion of rotenone to ether extract for the different treatments is of interest, the mean being 15.7 per cent.

As indicated previously, the rotenone content of root of this species of Derris is too low to admit of its being sold on such a basis. The root must be disposed of on a basis of ether extract, for which at present a lower price is paid. The ether extract of the root on an air-dry basis (moisture content 8 per cent.) is approximately 21.3 per cent.

The latest price for derris root sold on an ether extract basis is approximately 14 cents per lb. c.i.f. New York (Straits currency).

(B) *Derris elliptica*, Sarawak creeping.

Table IV shows the yields of air-dry marketable roots from individual plots arranged according to rows and manurial treatments.

Table IV.

Yields of Air-dry Marketable Root of *Derris elliptica*, Sarawak creeping, per Plot.

Row No.	Manurial Treatment				Row Total
	N P K	P Lime	Lime	Control	
	lbs.	lbs.	lbs.	lbs.	lbs.
1 ...	68.6	49.5	56.4	67.7	242.2
2 ...	55.1	47.9	73.5	55.1	231.6
3 ...	50.8	51.9	68.4	62.2	233.3
4 ...	52.6	56.6	53.6	59.6	222.4
Manurial Treatment Totals ...	227.1	205.9	251.9	244.6	929.5
Manurial Treatment Means ...	56.8	51.5	62.9	61.1	General Mean 58.1

Table V shows the calculated yields of root per acre for the various manurial treatments, the yields expressed as percentages of the control, and the costs of the manures based on prices prevailing in January, 1936.

Table V.

Calculated Yields of Root of *Derris elliptica*, Sarawak creeping, per Acre, Yields of Root expressed as Percentages of Control, and Comparative Costs of Manures.

Manurial Treatment	Mean Yield of Root per Plot	Calculated Yield of Root per acre	Yield of Root calculated as Percentage of Control	Cost of Manures per acre (January 1936)
	lbs.	lbs.	per cent.	$
N P K ...	56.8	1818	93.0	20.00
P Lime ...	51.5	1648	84.3	10.50
Lime ...	62.9	2013	102.9	9.00
Control ...	61.1	1955	100.0	—

The figures indicate a slightly greater mean yield of root for the control plots than for those receiving a complete manurial treatment or a mixture of rock phosphate and slaked lime. Statistical analysis of the figures showed, however, that these small differences in yield could not be attributed to the respective manurial treatments.

The calculated mean yield of 1,955 lbs. per acre for the control can be considered very satisfactory.

It can only be concluded, therefore, that the soil in this field is sufficiently fertile to produce a satisfactory yield of root of this species without the addition of artificial manures or lime and that their addition has no appreciable effect in that respect.

Table VI shows the figures for rotenone and ether extract for average samples of marketable root from the individual plots, together with the true averages for the different manurial treatments and control.

While there are small differences in toxic content, both for rotenone and ether extract, between treatments, statistical analysis shows that these differences are not significant.

Similarly to *D. malaccensis* var. *sarawakensis*, there is only a narrow range of variation in the figures for the average proportion of rotenone to ether extract for the different treatments. The mean figure is 30.1 per cent.

The rotenone content of root of this species is satisfactory and it can be disposed of on such a basis. The average rotenone content, calculated on an air-dry basis (moisture-content 8 per cent.), is 6.80 per cent.

The latest prices for root sold on this basis are about 20 cents per lb. (Straits currency) for root with a rotenone content from 5 to 6 per cent. and about 25 cents per lb. for root with a minimum of 8 per cent. In both cases the prices are for material c.i.f. New York.

Table VI.

Rotenone and Ether Extract of Marketable Root of *Derris elliptica*, Sarawak creeping, from Individual Plots.

(Moisture-free basis)

Manurial Treatment	Serial No. of Plot	Rotenone	Average Rotenone*	Ether Extract	Average Ether Extract*	Proportion of Rotenone to Ether Extract*	Average Proportion of Rotenone to Ether Extract*
		per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
N P K	1	6.29	7.30	20.18	24.14	31.1	30.2
	7	7.82		25.75		30.4	
	12	6.97		23.22		30.0	
	14	7.92		26.79		29.6	
P Lime	3	7.32	7.66	23.62	24.79	31.0	30.9
	8	7.48		24.29		30.8	
	10	7.96		27.02		29.5	
	13	7.85		24.22		32.4	
Lime	2	7.22	6.94	24.00	23.62	30.1	29.4
	5	7.25		23.68		30.6	
	11	6.63		23.00		28.8	
	16	6.62		23.86		27.7	
Control	4	6.26	7.19	22.90	24.24	27.4	29.7
	6	7.48		26.01		28.8	
	9	7.53		23.35		32.3	
	15	7.63		25.04		30.5	

* The average figures are the true averages calculated from the corresponding yields of root on each plot.

Stem Roots of Derris elliptica, Sarawak creeping.

Table VII shows the yields of air-dry stem roots from two individual plots for each manurial treatment together with the corresponding amounts of root recorded in Table IV.

Table VII.

Comparison of Yields of Air-dry Stem Root and of Root of *Derris elliptica*, Sarawak creeping, as usually Harvested.

Manurial Treatment	Serial No. of Plot	Weight of Stem Root	Weight of Root as usually Harvested (*cf.* Table IV)	Proportion of Stem Root to Root as usually Harvested
		lbs.	lbs.	per cent.
N P K	1	28.9	68.6	42.1 } 36.8
	14	16.5	52.6	31.4 }
P Lime	10	10.3	51.9	19.9 } 20.8
	13	12.2	56.6	21.6 }
Lime	2	13.5	56.4	23.9 } 23.9
	5	17.6	73.5	23.9 }
Control	6	16.2	55.1	29.4 } 27.3
	9	15.6	62.2	25.1 }

The results show no relationship between the amounts of the two kinds of root. The average figures range from 20.8 to 36.8 per cent.

The relatively large proportion of the fine stem roots in the case of the two plots for the complete manurial treatment is of interest.

Table VIII shows the figures for rotenone and ether extract for average samples of stem root from two individual plots for each manurial treatment.

A comparison of these figures with those given in Table VI shows that the fine stem roots have a much lower toxic content both in respect of rotenone and ether extract.

The question of the inclusion of the fine stem roots depends on whether the cost of separating them can be more than counterbalanced by an increased yield of root of a slightly reduced toxic content.

In the present experiment, the total yield of air-dry root from the 8 plots as usually harvested was 476.9 lbs. with a calculated rotenone content of 6.80 per cent. The total yield of air-dry stem roots from the same plots was 130.8 lbs. with a calculated rotenone content of 3.57 per cent.

The total yield of both kinds of root amounts, therefore, to 607.7 lbs. with a rotenone content of 5.92 per cent.

Table VIII.

Rotenone and Ether Extract of Stem Root of *Derris elliptica*, Sarawak creeping, from Individual Plots.

(Moisture-free basis)

Manurial Treatment	Serial No. of Plot	Rotenone	Average Rotenone*	Ether Extract	Average Ether Extract*	Proportion of Rotenone to Ether Extract	Average Proportion of Rotenone to Ether Extract*
		per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
N P K	1 14	3.49 3.50	3.50	12.75 12.06	12.50	27.4 29.0	28.0
P Lime	10 13	3.88 4.46	4.20	14.68 14.51	14.59	26.4 30.7	28.8
Lime	2 5	3.46 4.51	4.05	10.83 14.80	13.08	32.0 30.5	30.9
Control	6 9	3.70 4.33	4.01	12.66 12.44	12.55	29.3 34.9	32.0

* The average figures are the true averages calculated from the corresponding yields of root on each plot.

The inclusion of the stem roots would still allow of the root being disposed of on a basis of rotenone content, the lower limit for this being 5 per cent.

As stated previously, the work is tedious, and necessitates the unravelling of the individual stems. A labourer may recover about 8 lbs. of these fine roots per day. Assuming the moisture content of the fresh root to be about 65 per cent., the above quantity would be equivalent to about 3.5 lbs. of air-dry root.

Assuming that the quality of a consignment is unaffected by the inclusion of the fine stem roots, then 3.5 lbs. would be worth, on the basis of the price previously quoted, about 70 cents. This is only slightly more than the bare cost of harvesting.

Summary.

The results of the investigation may be summarized as follows:—

(a) *Derris malaccensis* var. *sarawakensis*.

(i) This species, while yielding poorly on the control plots, showed a marked response to the application of manures.

(ii) The calculated yield of root for the figures of control plots amounted to 597 lbs. per acre, increasing to about 1,000 lbs. per acre as a result of the application of manures.

(iii) Lime applied at the rate of half a ton per acre proved the most economical treatment.

(iv) The toxic content of the root was unaffected as a result of any of the manurial treatments.

(v) Root of this species can be disposed of only on a basis of ether extract, the rotenone content being insufficient to meet the present minimum market standard of 5 per cent.

(b) *Derris elliptica*, Sarawak creeping.

(i) The calculated mean yield of root for the control plots amounted to 1,955 lbs. per acre.

(ii) Manurial treatments were without significant effect on the yield of root.

(iii) The toxic content of the root was unaffected as a result of any of the manurial treatments.

(iv) Root of this species can be disposed of on a basis of rotenone content.

(v) The harvesting of the fine stem roots associated with plants of this species is shown to be a doubtful economic proposition.

References.

1. Varietal and Manurial Trials with Derris. C.D.V. Georgi, J. L. Greig and Gunn Lay Teik. *Malayan Agricultural Journal*, Vol. XXIV, No. 6, June 1936, p. 268.

2. Variation in Toxic Content of Roots of *Derris malaccensis* var. *sarawakensis* with Increase in Age of Plants, C. D. V. Georgi and Gunn Lay Teik. *Malayan Agricultural Journal*, Vol. XXVII No. 4, April 1939, p. 134.

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Departmental.

FROM THE DISTRICTS.

Compiled by the Chief Field Officer from Monthly Reports of Agricultural Officers.

May, 1939.

The Weather.

In North Kedah normal wet weather was experienced, but in Central and South Kedah unusual heavy falls of rain occurred; at Sungei Patani 20 inches were recorded.

In Krian, north and west Perak, Penang and Province Wellesley, similarly heavy rainfall occurred, the total precipitation in Penang being almost double the normal figure. A large proportion of this rain fell on the 6th and 7th May, 12 inches being recorded during the two days at Bukit Mertajam and 9.37 inches on the 7th alone at Bukit Merah. Floods were widespread, and it is reported that much coarse sand carried down from clean-weeded holdings in Kedah and the west of the Province was deposited on the rice fields near rivers. There were similar heavy falls of rain on these two days in the other parts of the country mentioned and some flooding.

Elsewhere in Perak, and in Pahang, Selangor and Negri Sembilan, weather conditions were as usual, the rain being heavier during the first half of the month than in the latter half.

In Johore and Singapore the weather was hot and dry and the rainfall below normal.

Crop Reports.

Rubber.—Prices tended to improve and good quality smoked sheet fetched from $33 to $35 per picul. The top price reached in Singapore was $37. This price increase and the advent of favourable weather resulted in an increase of tapping in certain areas.

Padi.—In the main northern padi growing areas preparations and cultivation for the new season's crop are now commencing.

At Panchang Bedena in Selangor the harvest is now over. Returns have not yet been received, but it is expected that yields will be satisfactory. The price paid by dealers for padi has ranged between 9 and 12 cents per gantang. Already 5 tongkang loads of padi have left Sungei Besar for Kuala Selangor and Klang.

The Padi Buying Agency at Sungei Manik in Perak bought at 7½ cents per gantang on several occasions, and early in the month Chinese dealers were paying up to 8 cents. Prices later stood at 6½ to 7½ cents.

In Malacca, sites have been chosen and all arrangements made for seed farms for the new season. Evidence of the increasing utility of seed farms has been noticeable in all districts in this Settlements during the local padi competition. "Seed farm" is now a recognized term among many cultivators and there is evidence that

the amount of seed padi being distributed is increasing greatly. For the coming season the number of varieties of padi grown in seed farms will be extended and will now include Siam 29, Milek Puteh 9, Nachin 11 and Serendah strains. Hitherto only Siam 29 and Milek Puteh 9 were used.

Coconuts.—Almost all copra at present marketed by small-holders is sold in an under-dried condition, and market prices are accordingly standardized on a basis of high moisture content. At present prices the differences in price between well-prepared and under-dried copra is very small and preparation of the former cannot economically be carried out. The position is well illustrated by the following extract from the report of the State Agricultural Officer, Kelantan:—

> " At Bachok good dry copra is at present fetching $2.95 per picul as against $2.70 for the normal under-dried product. But whereas 1,000 nuts will produce 5 piculs of the latter, barely 4½ piculs of the former are obtained. From these figures it is not surprising that our drive for good quality copra continues to languish."

Bananas in Negri Sembilan.—Exports of bananas during May were as follows:—Jelebu 10,603 piculs, Seremban 509 piculs. In both Districts a decline in yield is reported due to the fact that little new planting is taking place, whilst the older plantations have deteriorated. In most of these holdings what soil remains is so impoverished that replanting is out of the question and the lack of new land necessitates calling a halt to the exploitation which has taken place in the past in the growing of this crop.

Livestock

Pigs.—In Penang the market for pigs has improved considerably, prices reaching $15 per picul liveweight. In Malacca on the other hand prices declined from $14.50 to $13 per picul. The reason for this decline in price is not clear as the price of pork in Malacca markets has not fallen.

Buffaloes.—Another pair of buffaloes has been purchased for the buffalo farm at Pulau Gadong Station, Malacca. Four newly calved cows are being milked regularly and their yield is gradually increasing. The cows are now quieter and easier to milk. The milk is being made into ghee which is reported to be of excellent quality.

Ipoh Dairy Farm.—In an endeavour to find additional grazing land outside the farm area, an aerial survey of the environs of Ipoh was carried out by the Agricultural Officer. The only possible land available is situated some 12 miles outside the town.

Statistical.

MARKET PRICES.

May 1939.

Major Crops.

Rubber.—There was a definite improvement in values during May, and the Singapore market rose by $1\frac{3}{4}$ cents per lb. from $27\frac{1}{4}$ cents at opening to 29 cents at the close. The average of daily quotations for No. 1. X. Ribbed Smoked Sheet was 27.88 cents per lb., as compared with 27.22 cents in April. The London average price was 8 pence and New York 15.95 cents gold, as compared with 7.93 pence and 15.78 cents gold in April.

Prices paid for small-holders' rubber at three centres during the month are given in Table 1.

Table I.

Weekly Prices Paid by Local Dealers for Small-Holders' Rubber, May, 1939.

(Dollars per picul of 133 1/3 lbs.)

Grades	Kuala Kangsar, Perak			Kuala Pilah, Negri Sembilan			Batu Pahat, Johore.			
	10	17	31	4	18	25	3	10	17	31
Smoked Sheet ...	34.00	35.50	36.00	—	—	—	—	34.10	—	—
Unsmoked Sheet ...	—	—	—	33.00	33.00	33.50	32.47	33.25	33.60	35.00
Scrap ...	No purchases									

Transport by F.M.S.R. lorry service Kuala Pilah to Seremban 12 cents per picul, to Malacca excluding duty, 25 cents per picul, by rail Seremban to Penang $1.24 per picul, Seremban to Singapore $8.00 per ton.

Transport from Batu Pahat to Singapore by lorry excluding duty, 90 cents per picul.

Transport from Kuala Kangsar to Prai by railway $6.20 per ton.

Transport from Kuala Kangsar to Singapore by railway $10.00 per ton (minimum consignment 5 tons).

At Kuala Pilah the standard deduction for moisture in unsmoked sheet is 5 per cent.

No purchases of rubber at Kuala Pilah on the 11th, at Batu Pahat on the 24th, and at Kuala Kangsar on the 3rd and 24th May.

Palm Oil.—Prices improved slightly during May, and the month's quotations are given in Table II. The averages of the April weekly quotations were:—palm oil £13.1.2, kernels £8.12.6.

Table II.

Prices of Palm Oil and Palm Kernels.

Date 1939.	Palm Oil in Bulk, c.i.f. landed weight Liverpool/ Halifax.	Palm Kernels, c.i.f. landed weight London/ Continent
	per ton	per ton
May 5	£ 13. 2. 6 Liverpool	£ 8. 12. 6 Rotterdam
,, 12	13. 2. 6 ,,	9. 0. 0 London
,, 19	13. 10. 0 ,,	9. 0. 0 ,,
,, 26	13. 5. 0 Canada	9. 0. 0 Hamburg
Average	£ 13. 2. 6	£ 8. 18. 2

Copra.—Values improved during May. The sun-dried grade rose from $3.50 per picul at opening to $3.90 on the 11th and 12th, weakening slightly in the second half of the month and closing at $3.85. The Singapore average price for the month of this grade was $3.75 per picul, as compared with $3.47 in April, and the mixed grade continued to be quoted at 30 cents per picul lower.

Copra cake remained unchanged at $1.60 per picul.

Rice.—The Singapore average wholesale prices of rice per picul in April were as follows:—Siam No. 2 Ordinary $3.71, Rangoon No. 1 $3.17, Saigon No. 1 $3.42, as compared with $4.06, $3.17 and $3.47 in March, and with $3.98, $3.62 and $3.85 in April 1938.

The average retail prices in cents per gantang (gallon) of No. 2 Siam rice were: Singapore 26, Penang 32, Malacca 28, and were unchanged from March.

The average declared trade value of imports during April was $3.72 per picul, as compared with $3.76 in March and $3.68 in February.

Padi.—Prices of padi per 100 gantangs (gallons) ranged from $8 to $12 in most parts of the country. In Kedah the range was $7.70 to $8.40; in Johore $10 to $11; and in Malacca $9 to $10. In Province Wellesley the price was $8.80.

The prices paid by the Government Rice Mills during May remained unchanged: Bagan Serai, Perak, $2.20; Parit Buntar, Perak, $2.10; Temerloh, Pahang, $2.20.

Pineapples.—The Central Board of Packers raised the prices of all canned pineapples in the first half of May. The new prices, per case of 48 cans of 1½ lbs. each are as follows:—G.A.Q.: Sliced Flat $3.20, Sliced Tall $3.35, Cubes $3.25; Golden $3.60, $3.75 and $3.65 respectively.

Fresh fruit prices per 100 were as follows:—Singapore 90 cents to $1.70; Selangor 58 to 80 cents; Johore, 1st quality $1.05 to $2.20, 2nd quality 70 cents to $1.20, 3rd quality 50 cents to $1.

Beverages.

Tea.—During May three consignments of Malayan highland tea, comprising 240 packages, were sold on the London market at prices ranging from 1s.3d. to 1s.3¾d per lb., the average being 1s.3.42d. Four consignments of lowland tea, comprising 294 packages, were sold at prices ranging from 11¼d. to 1s.0¾d. per lb., the average price being 1s.0¼d.

The average London prices per lb. realized for tea from other countries, according to the *Tea Market Reports* for May of the Tea Brokers' Association of London, were as follows:—Ceylon 1s.3.89d., Java 1s.2d., Indian Northern 1s.1.17d., Indian Southern 1s.3.35d., Sumatra 11.53d.

The latest Colombo prices available, quoted from *The Ceylon Tea Market Report* of 30th May, 1939, of the Colombo Brokers' Association, are as follows, in rupee cents per lb.:—High Grown Teas 75, Medium Grown Teas 68, Low Grown Teas 65.

Coffee.—Liberian coffee continued unchanged at $14.50 per picul. Excelsa improved from $10.25 to $10.50 per picul, and Robusta improved from $6.50 to $6.75 per picul.

The average of highest and lowest quotations in Singapore for Palembang coffee was $11.34 to $12.51 per picul, and for Sourabaya coffee $8.31 to $9.81, the price within these ranges depending upon quality.

Spices.

Arecanuts.—The averages of the Singapore Chamber of Commerce quotations per picul were:—Best $7.20, Medium $6.76, Mixed $6.15.

The averages of the highest and lowest quotations per picul in Singapore were as follows:—Splits $4.50 to $6.65; Red Whole $5.19 to $6.69; Sliced $7.62 to $9.62; as compared with $4.62 to $6.65, $5.06 to $6.80, and $9.44 to $12.81 respectively in April.

Pepper.—There was a slight rise in prices during May. Singapore Black continued at the April closing price of $8 per picul. Singapore White averaged $12.44, and Muntok White $12.69. The April average prices were $8.12, $12.40 and $12.65 respectively.

Nutmegs.—Both 110's and 80's continued unchanged at $28 per picul. Penang dried nutmegs were sold at $19 per picul.

Mace.—Prices continued unchanged: Siouw $85 per picul (nominal), Amboina $58 per picul. Locally produced mace, dry, was sold in Penang at $70 per picul.

Cloves.—Nominal quotations in Singapore continued unchanged: $40 per picul for both Zanzibar and Amboina. Penang cloves, dried, sold in Penang at $45 per picul.

Cardamoms.—Green cardamoms were quoted in *The Ceylon Chamber of Commerce Weekly Report* for 29th May, 1939, from Rs. 1.10 to Rs. 1.20 per lb.

Miscellaneous.

Derris.—Fair quantities of root were available during May. Singapore prices remained practically unchanged: $7.50 to $9 per picul for roots sold on a basis of ether extract; $17.50 to $18.50 per picul for roots sold on rotenone content.

Gambier.—Block was quoted throughout the month at $8 (nominal) per picul, and No. 1 Cube improved to $17 per picul, as compared with April averages of $7.40 and $15.40 respectively.

Sago.—Pearl averaged $4.28 per picul in May, and Flour, Sarawak Fair, averaged $2.54, as compared with $4.01 and $2.52 respectively in April.

Tapioca.—Prices of all grades improved during May. Flake Fair rose to $4.30 per picul, averaging $4.18; Seed Pearl rose to $5, averaging $4.81; and Pearl Medium rose to $5, averaging $4.94 per picul. The April average prices were $3.85, $3.94 and $4.50 respectively.

Tobacco.—Kelantan prices of prepared tobacco were lower during May and were, per picul:—1st quality $127, 2nd quality $87, 3rd quality $67. The general range of the three grades in other parts of the country was:—$16 to $25; $10 to $23; $5 to $14. In Kedah the range was $32 to $40; $20 to $25; $13 to $18; and in Penang and Province Wellesley $34; $30; $20. In Malacca prices ranged from $17 to $20, and in Johore $9 to $23 for dried leaf, and $40 to $112 for prepared tobacco.

The above prices are based on London and Singapore daily quotations for rubber, on the Singapore daily prices for copra, on the Singapore Chamber of Commerce Weekly Reports for the month and on other local sources of information. Palm oil reports and certain coffee prices are kindly supplied by Guthrie & Co. Ltd., Kuala Lumpur, the Singapore prices of imported coffee and arecanuts by Lianqui Trading Company of Singapore, and Singapore derris prices by Hooglandt & Co., Singapore.

1 Picul = 133 1/3 lbs. The Dollar is fixed at two shillings and four pence.

Note.— The Department of Agriculture will be pleased to assist planters in finding a market for agricultural produce. Similar assistance is also offered by the Malayan Information Agency, 57, Trafalgar Square, London, W.C.2.

GENERAL RICE SUMMARY*

April, 1939.

Malaya.—Imports of foreign rice during April were 59,210 tons,† and exports 8,837 tons. Net imports were accordingly 50,373 tons, as compared with 51,747 tons in 1938.¶

Of the April imports 37 per cent. were consigned to Singapore, 22 per cent. to Penang, 6 per cent. to Malacca, 28 per cent. to the Federated Malay States, and 7 per cent. to the Unfederated Malay States. The foreign imports by countries of origin were as follows (in tons, percentages in brackets):—Siam 33,935 (57.3), Burma 21,535 (36.4), French Indo-China 2,210 (3.7), other countries 1,530 (2.6).

Of the exports during April 73 per cent. were consigned to the Netherlands Indies and 27 per cent. to other countries. The various kinds of rice exported were as follows (in tons, percentages in brackets):—Siam 7,851 (88.8), Burma 743 (8.4), French Indo-China 172 (2.0), parboiled 46 (0.5), Malayan production 25 (0.3).

April net imports by countries of origin were (in tons, percentages in brackets):—Siam 26,084 (51.8), Burma 20,792 (41.3), French Indo-China 2,038 (4.0), elsewhere 1,459 (2.9).

India.—Foreign exports during the first quarter of the year were 81,000 tons, as compared with 61,000 in 1938, an increase of 32.8 per cent. Of these exports 3.7 (4.9) per cent. were to the United Kingdom, 1.2 (8.2) per cent. to the Continent of Europe, 37.0 (44.3) per cent. to Ceylon, 5.0 (4.9) per cent. to the Straits Settlements and the Far East, and 53.1 (37.7) per cent. to other countries. The percentages in brackets are for the corresponding period in 1938.

Burma.—Foreign exports from the 1st January to 26th April totalled 1,600,083 tons, as compared with 1,336,790 in 1938, an increase of 19.7 per cent. Of these exports 58.2 (43.9) per cent. were to India, 6.4 (9.1) per cent. to the United Kingdom, 5.7 (6.7) per cent. to the Continent of Europe, 8.7 (10.7) per cent. to Ceylon, 7.9 (13.5) per cent. to the Straits Settlements and the Far East, and 13.1 (16.1) per cent. to other countries. The percentages in brackets are for the corresponding period of 1938.

Average April prices of rice in rupees per 100 baskets of 75 lbs. each at Rangoon were:—Big Mills Specials 224, Small Mills Specials 228.

Siam.—Exports of rice and rice products from Bangkok during January were 131,590 tons, as compared with 113,954 tons in 1938.

Japan.—The latest information available was published in the February Summary.

French Indo-China.—Entries of padi into Cholon during the first four months of the year totalled 808,529 tons, as compared with 518,565 tons in 1938, an increase

* Abridged from the Rice Summary for April 1939 compiled by the Department of Statistics, Straits Settlements and Federated Malay States.

† Ton = long ton (2,240 lbs.)

¶ It is to be understood throughout the summary that all comparisons and percentage increases or decreases are in relation to the corresponding period of 1938.

of 55.9 per cent. Exports of rice during the same period were 708,650 tons, as compared with 494,319 tons in 1938, an increase of 43.4 per cent.

The Saigon rice and padi market was active during March and prices tended to rise. Prices opened at $2.77, rose to $2.87, fell to $2.77, and closed at $2.79 per picul. The price of padi rose from $1.73 to $1.82, closing at $1.80 per picul.

The Netherlands Indies.—The latest information available was published in the March Summary.

Ceylon.—Imports during the first four months of the year totalled 206,178 tons, as compared with 183,572 tons in 1938, an increase of 12.3 per cent. Of these imports 14.7 (15.6) per cent. were from British India, 64.2 (73.6) per cent. from Burma, 0.5 (0.5) per cent. from the Straits Settlements, and 20.6 (10.3) per cent. from other countries. The 1938 percentages are in brackets.

Europe and America.—Shipments from the East to Europe from the 1st January to 14th April totalled 461,451 tons, as compared with 313,756 tons in 1938, an increase of 47.1 per cent. Of these shipments 43.0 (56.6) per cent. were from Burma, 45.4 (34.1) per cent. from Saigon, 10.4 (6.2) per cent. from Siam, and 1.2 (3.1) per cent. from Bengal. The 1938 percentages are in brackets.

Shipments from the Levant from 1st January to 12th April totalled 8,433 tons, as compared with 6,671 tons in 1938, an increase of 26.4 per cent. Shipments for Cuba, West Indies and America from 1st January to 13th April were 72,005 tons, as compared with 62,560 tons in 1938, an increase of 15.1 per cent.

FERTILIZER PRICES, MAY, 1939.

The following are the prices at the end of May, 1939, of some of the more important fertilizers.

Product.	Analysis				Price per ton $
	Nitrogen (N)	Phosphoric Acid (P_2O_5)		Potash (K_2O)	
		Soluble	Insoluble		
Sulphate of Ammonia ...	20.6	—	—	—	72.75
Calcium Cyanamide ...	20.6	—	—	—	80.00
Muriate of Potash ...	—	—	—	50	112.00
Sulphate of Potash ...	—	—	—	48	112.00
Superphosphate (concentrated) ...	—	39	—	—	105.00
Superphosphate ...	—		—	—	60.00
Basic Slag ...	—	16	—	—	48.00
Rock Phosphate (Christmas Island) ...	—	11*	38‡	—	33.50
Rock Phosphate (very finely ground Gafsa) ...	—	11*	26 - 28‡	—	40.00
Lime ...	—	—	—	—	20.00

* Citric soluble. ‡ Total

Quotations are *ex* warehouse, Port Swettenham, Klang, Singapore and Penang, with the exception of muriate of potash which is *ex* warehouse, Port Swettenham, Klang and Singapore.

The above quotations for concentrated superphosphate, superphosphate and Christmas Island phosphate are *ex* warehouse Penang, Port Swettenham and Klang. The Singapore quotations for these three fertilizers are $95, $50 and $31.50 per ton respectively.

MALAYAN AGRICULTURAL EXPORTS, MARCH, 1939.

PRODUCT.	Net Exports in Tons				
	Year 1938	Jan./Mar. 1938	Jan./Mar. 1939	March 1938	March 1939
Arecanuts ...	33,769	11,331	10,588	4,450	2,731
Coconuts fresh†‡ ...	116,743†	22,745†	24,862†	10,734†	9,135†
Coconut oil‡ ...	49,140	11,505	12,993	4,613	4,361
Copra‡ ...	68,754	10,140	3,707	3,403	2,612
Copra cake ...	7,112	1,603	1,853	920	949
Gambier, all kinds ...	1,632	425	618	180	195
Palm kernels ...	9,359	2,176	2,824	1,005	816
Palm oil ...	54,377	12,950	12,078	5,691	5,459
Pineapples, canned ...	73,168	20,211	18,987	8,767	7,616
Rubber¶ ...	360,898¶	108,455¶	78,762¶	35,972¶	21,214¶
Sago,—flour ...	4,537	2,520	2,316	2,014	456
,, —pearl ...	4,203	962	796	328	360
,, —raw ...	5,088*	1,710*	888*	555*	362*
Tapioca,—flake ...	981	246	252	54	142
,, —flour ...	3,072*	858*	854*	252*	496*
,, —pearl ...	17,818	4,070	3,583	1,924	1,301
Derris ...	676	80	358	27	154
‡Copra equivalent ...	150,944	29,291	25,318	11,114	9,882

† hundreds in number. * net imports. ¶ production.

MALAYAN PRODUCTION OF PALM OIL AND KERNELS

(In long tons, as declared by Estates).

Month 1939	Palm Oil			Palm Kernels		
	F.M.S.	U.M.S.	Malaya	F.M.S.	U.M.S.	Malaya
January ...	2,402.5	2,726.3	5,128.8	429.7	502.0	931.7
February ...	2,193.4	1,693.3	3,886.7	372.9	282.0	654.9
March ...	2,453.1	2,324.8	4,777.9	437.9	394.0	831.9
April ...	2,159.6	2,082.2	4,241.8	423.4	346.0	769.4
Total ...	9,208.6	8,826.6	18,035.2	1,663.9	1,524.0	3,187.9
Total January to April, 1938 ...	8,605.4	5,732.0	14,337.4	1,554.5	1,055.0	2,609.5
Total for the year 1938 ...	28,979.0	22,087.7	51,066.7	5,158.9	3,620.0	8,778.9

Stocks on estates as at 30th April, 1939, were: palm oil 4,249 tons, palm kernels 580 tons.

MALAYAN RUBBER STATISTICS

Acreages of Tappable Rubber actually Tapped and not Tapped on Estates of 100 Acres and over, for the Month ending 30th April, 1939.

State or Territory	Estimated Acreages of Tappable Rubber (9)+(11)	Acreages of Tappable Rubber not Tapped				Area of tappable rubber never been tapped (b)		Total area not tapped (3)+(5) (c)		Total area Tapped during the month		Area of tappable rubber rested under rotational systems (c)	
		On estates which have entirely ceased tapping		On estates which have partly ceased tapping (a)									
		Acreage	Percentage of (3) to (2)	Acreage	Percentage of (5) to (2)	Acreage	Percentage of (7) to (2)	Acreage	Percentage of (9) to (2)	Average	Percentage of (11) to (2)	Acreage	Percentage of (13) to (2)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
S. S.—													
Province Wellesley ...	43,111	1,855	4.3	15,805	36.7	521	1.2	17,660	41.0	25,451	59.0	7,582	17.6
Malacca ...	120,462	5,757	4.8	37,006	30.7	2,160	1.8	42,763	35.5	77,699	64.5	24,340	20.2
Penang ...	2,479	—	—	1,184	47.8	9	0.4	1,184	47.8	1,295	52.2	60	2.4
Singapore ...	32,108	6,701	20.9	9,628	30.0	135	0.4	16,329	50.9	15,779	49.1	3,553	11.1
Total S.S. ...	198,160	14,313	7.2	63,623	32.1	2,825	1.4	77,936	39.3	120,224	60.7	35,535	17.9
F. M. S.—													
Perak ...	285,572	12,698	4.5	79,984	28.0	8,189	2.9	92,682	32.5	192,890	67.5	48,931	17.1
Selangor ...	319,141	26,502	8.3	74,352	23.3	7,345	2.3	100,854	31.6	218,287	68.4	53,682	16.8
Negri Sembilan ...	264,281	20,502	7.8	78,560	29.7	16,711	6.3	99,062	37.5	165,219	62.5	43,557	16.5
Pahang ...	85,777	5,064	5.9	27,990	32.6	5,733	6.7	33,054	38.5	52,723	61.5	9,765	11.4
Total F.M.S. ...	954,771	64,766	6.8	260,886	27.3	37,978	4.0	325,652	34.1	629,119	65.9	155,935	16.3
U. M. S.—													
Johore ...	481,762	24,413	5.0	142,987	29.7	37,558	7.8	167,400	34.7	314,362	65.3	74,196	15.4
Kedah ...	194,977	9,772	5.0	35,247	18.1	6,407	3.3	45,019	23.1	149,958	76.9	43,758	22.4
Kelantan ...	31,223	403	1.3	7,940	25.4	2,423	7.8	8,343	26.7	22,880	73.3	5,506	17.6
Trengganu (d) ...	4,817	nil	nil	49	1.0	nil	nil	49	1.0	4,768	99.0	1,651	34.3
Perlis (e) ...	1,459	458	31.4	239	16.4	155	10.6	697	47.8	762	52.2	294	20.2
Brunei ...	6,080	nil	nil	3,646	60.0	316	5.2	3,646	60.0	2,434	40.0	1,096	18.0
Total U.M.S. ...	720,318	35,046	4.9	190,108	26.4	46,859	6.5	225,154	31.3	495,164	68.7	126,501	17.6
Total Malaya ...	1,873,249	114,125	6.1	514,617	27.5	87,662	4.7	628,742	33.6	1,244,507	66.4	317,971	17.0

Notes.—(*a*) Area out-of-tapping on estates which have partly ceased tapping refers to areas definitely being rested and excludes areas on any tapping round.

(*b*) The acreage shown in column (7) is included in columns (3) and (5).

(*c*) Areas of tappable rubber rested under rotational systems are not considered as out-of-tapping and therefore columns (11) and (12) include columns (13) and (14) respectively.

(*d*) Registered companies only.

ACREAGE, STOCKS, PRODUCTION, IMPORTS AND EXPORTS OF RUBBER, INCLUDING LATEX, CONCENTRATED LATEX AND REVERTEX, FOR THE MONTH OF APRIL, 1939, IN DRY TONS.

State or Territory	Stocks at beginning of month 1			Production by Estates of 100 acres and over		Production by Estates of less than 100 acres estimated 2		Imports				Exports including re-exports				Stocks at end of month			Consumption 3	
								during the month		January to April 1939		during the month		January to April 1939						
	Ports	Dealers	Estates of 100 acres and over	during the month	Jan. to April 1939	during the month	Jan. to April 1939	Foreign	From Malay States & Labuan	Foreign	From Malay States & Labuan	Foreign	Local	Foreign	Local	Ports	Dealers	Estates of 100 acres and over	during the month	Jan. to April 1939
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MALAY STATES :—																				
Federated Malay States ...	...	3,220	28,702	8,078	37,058	5,867	16,742	Nil	Nil	Nil	Nil	10,939	4,343	45,301	9,497	...	5,309	25,261	15	63
Johore ...	...	1,844	10,819	3,768	16,752	3,293	10,581	Nil	31	Nil	137	2,404	5,288	10,328	17,262	...	2,367	9,696	...	...
Kedah ...	...	124	5,984	2,211	9,139	897	2,844	Nil	Nil	Nil	Nil	1,534	1,980	5,567	6,748	...	299	5,403	...	...
Perlis ...	...	9	35	4	29	29	82	Nil	Nil	Nil	Nil	Nil	28	Nil	105	...	24	25	...	...
Kelantan ...	...	442	781	230	1,112	775	2,228	Nil	Nil	Nil	Nil	461	618	1,197	2,082	...	649	500	...	...
Trengganu ...	...	3	359	131	486	325	878	Nil	Nil	Nil	Nil	Nil	486	Nil	1,372	...	47	285	...	...
Brunei ...	...	Nil	97	15	123	84	240	...	...	...	...	...	117	...	384	...	15	64	...	...
Total Malay States	...	5,642	46,777	14,437	64,699	11,270	33,595	Nil	31	Nil	137	15,338	12,860	62,393	37,450	...	8,710	41,234	15	63
S. SETTLEMENTS :—																				
Malacca ...	...	1,322	2,471	850	3,587	500	1,831	Nil		Nil		2,011		8,646		...	1,349	2,260	...	...
Province Wellesley	...	545	986	306	1,284	155	568	Nil		Nil		5,440		23,678		...	486	888	...	...
Penang ...	704	2,748	8	15	59	48	228	1,347	10,994	10,287	37,594		Nil		Nil	1,496	1,942	13	...	...
Singapore ...	3,184	16,633	244	91	384	15	189	12,603		50,481		20,869		78,616		3,338	15,669	280	28	105
Labuan ...	...	10	Nil	Nil	Nil	8	33	46		201		Nil		Nil		...	18	Nil	...	...
Total Straits Settlements ...	3,888	21,258	3,709	1,262	5,314	726	2,849	13,996	10,994	60,969	37,594	28,320	Nil	110,940	Nil	4,834	19,464	3,441	28	105
Total Malaya ...	3,888	26,900	50,486	15,699	70,013	11,996	36,444	13,996	11,025	60,969	37,731	43,658	12,860	173,333	37,450	4,834	28,174	44,675	43	168

TABLE II
DEALERS' STOCKS, IN DRY TONS 3

Class of Rubber	Federated Malay States	S'pore	Penang	Province We'sly D'dings M'cca.	Johore	Kedah
22	23	24	25	26	27	28
DRY RUBBER	4,691	15,299	1,860	1,643	1,808	169
WET RUBBER	618	370	82	225	559	130
TOTAL ...	5,309	15,669	1,942	1,868	2,367	299

TABLE III
FOREIGN EXPORTS

PORTS	For month	Jan. to April 1939
29	30	31
Singapore ...	30,384	119,228
Penang ...	8,836	37,381
Port Swettenham.	4,438	16,214
Malacca ...	Nil	510
MALAYA ...	43,658	173,333

TABLE IV
DOMESTIC EXPORTS 4

AREA	For month	Jan. to April 1939
32	33	34
Malay States ...	28,189	99,687
Straits Settlements	2,075	8,138
MALAYA ...	30,264	107,825

Notes :—

1. Stocks on estates of less than 100 acres and stocks in transit on rail, road or local steamer are not ascertained
2. The production of estates of less than 100 acres is estimated from the formula : Production + Imports + Stocks at beginning of month = Exports + Stocks at end of month, + Consumption, *i.e.*, Column [7] = Columns [13] + [14] + [17] + [18] + [19] + [20] − [2] − [3] − [4] − [5] − [9] − [10]. For the Straits Settlements the production of estates of less than 100 acres is represented by sales or exports as shown by cess paid.
3. Dealers' stocks in the Federated Malay States are reduced to dry weights by the following fixed ratios: unsmoked sheet, 15% wet sheet, 25% scrap, lump, etc., 40%; stocks elsewhere are in dry weights as reported by the dealers themselves.
4. Columns (33) and (34) represent exports of rubber subject to regulation which, for Singapore and Penang Islands are represented by sales or exports as shown by cess paid.
5. All statements are brought up to date monthly, and any inaccuracies that may be disclosed are corrected in the totals; the latest publication therefore, is always the most reliable.
6. The above, with certain omissions, is the Report published by the Registrar-General of Statistics, S.S and F.M.S., at Singapore on 25th May, 1939

METEOROLOGICAL SUMMARY, MALAYA, APRIL, 1939.

Locality.	Air Temperature in degrees Fahrenheit							Earth Temperature		Rainfall								Bright Sunshine.		
	Means of			Absolute Extremes						Total.		Most in a day.	Number of days.					Total.	Daily Mean.	Per cent.
	A. Max.	B. Min.	Mean of A and B	Highest Max.	Lowest Min.	Lowest Max.	Highest Min.	At 1 foot	At 4 feet			Amt.	Precipitation .01 in or more	Precipitation .04 in or more	Thunder-storm	Fog morning obs.	Gale force 8 or more			
	°F	°F	°F	°F	°F	°F	°F	°F	°F	in.	mm.	in.						hrs.	hrs.	
Railway Hill, Kuala Lumpur, Selangor ...	91.3	72.9	82.1	95	69	85	76	84.7	85.1	7.30	185.4	1.55	21	17	9	6	—	190.30	6.34	52
Bukit Jeram, Selangor ...	90.1	73.1	81.6	93	70	85	76	85.5	87.2	4.54	115.3	0.98	18	17	—	1	—	233.40	7.78	64
Sitiawan, Perak ...	89.5	73.8	81.7	92	70	86	77	84.6	84.8	8.47	215.1	2.66	19	17	3	—	1	212.80	7.09	58
Ipoh Aerodrome, Perak ...	90.5	73.4	81.9	94	71	83	76	84.2	84.5	11.80	299.7	3.27	21	20	9	—	—	192.15	6.41	53
Temerloh, Pahang ...	89.6	73.2	81.4	95	70	77	76	85.5	86.2	6.93	176.0	1.15	20	17	3	10	—	185.40	6.18	51
Kuala Lipis, Pahang ...	89.7	72.1	80.9	94	69	76	75	84.4	84.6	5.28	134.1	2.17	19	13	6	30	—	184.05	6.13	50
Kuala Pahang, Pahang ...	86.6	74.7	80.7	91	72	76	77	86.1	86.3	13.52	343.4	3.99	13	11	1	—	—	227.45	7.58	62
Kallang Aerodrome, S'pore ...	86.9	76.0	81.5	91	73	79	79	83.0	83.7	8.73	221.7	3.14	16	16	3	—	—	173.65	5.79	47
Bayan Lepas Aerodrome Penang ...	87.9	75.1	81.5	90	73	82	77	85.4	85.7	10.45	265.4	2.61	23	17	7	—	1	217.95	7.27	59
Malacca Town, Malacca ...	86.9	73.9	80.4	91	71	84	77	84.3	85.1	5.29	134.4	1.40	15	13	10	—	2	204.40	6.81	56
Kluang, Johore ...	89.2	72.2	80.7	94	71	79	74	82.2	82.4	9.68	245.9	1.50	22	20	12	18	—	174.30	5.81	48
Mersing, Johore ...	86.7	72.6	79.7	91	70	77	74	82.8	82.1	15.43	391.9	5.67	23	21	1	—	1	221.20	7.37	60
Alor Star, Kedah ...	89.6	74.0	81.8	94	71	80	77	85.7	86.0	6.99	177.6	1.31	16	13	1	1	—	232.00	7.73	63
Kota Bahru, Kelantan ...	88.5	73.2	80.9	93	67	77	75	83.4	83.6	16.15	410.2	7.14	12	11	1	—	1	245.90	8.20	67
Kuala Trengganu, Trengganu	87.7	73.2	80.5	91	69	77	75	84.3	84.7	14.17	359.9	4.80	9	8	2	2	1	242.10	8.07	66
Labuan ...	87.6	76.3	81.9	92	72	78	81	87.3	87.8	12.64	321.1	4.66	13	10	1	—	—	246.65	8.22	67
HILL STATIONS.																				
Fraser's Hill, Pahang 4268 ft.	73.2	62.9	68.1	78	60	64	65	71.8	71.8	11.93	303.0	3.03	24	20	1	13	—	154.95	5.17	42
Cameron Highlands, Tanah Rata, Pahang 4750 ft. ...	73.5	58.0	65.7	77	50	67	63	70.4	69.2	8.50	215.9	1.29	24	22	3	4	—	142.45	4.75	39
Cameron Highlands, Rhododendron Hill, Pahang 5120 ft. ...	73.0	60.1	66.5	76	59	65	62	*	*	8.56	217.4	1.55	23	21	—	—	5	153.70	5.12	42

* Not recorded.